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# Report of the technical review of the sixth national communication of Estonia

Parties included in Annex I to the Convention are requested, in accordance with decision 9/CP.16, to submit a sixth national communication to the secretariat by 1 January 2014. In accordance with decision 7/CMP.8, Parties included in Annex I to the Convention that are also Parties to the Kyoto Protocol shall include in their sixth national communication supplementary information under Article 7, paragraph 2, of the Kyoto Protocol. In accordance with decision 15/CMP.1, these Parties shall start reporting the information under Article 7, paragraph 1, of the Kyoto Protocol with the inventory submission due under the Convention for the first year of the commitment period. This includes supplementary information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol.

This report presents the results of the technical review of the sixth national communication and supplementary information under the Kyoto Protocol of Estonia conducted by an expert review team in accordance with the "Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention" and the "Guidelines for review under Article 8 of the Kyoto Protocol".

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# I. Introduction and summary

## A. Introduction

1. For Estonia the Convention entered into force on 25 October 1994 and the Kyoto Protocol on 16 February 2005. Under the Convention, Estonia made a commitment to contribute to the joint European Union (EU) economy-wide target of a 20 per cent greenhouse gas (GHG) emission reduction below the 1990 level by 2020.

2. Under the Kyoto Protocol, Estonia committed itself to reducing its GHG emissions by 8 per cent compared with the base year[1] level during the first commitment period, from 2008 to 2012.

3. For the second commitment period of the Kyoto Protocol, from 2013 to 2020, Estonia committed to contribute to the joint EU commitment to reduce GHG emissions by 20 per cent below the base year level.

4. This report covers the centralized technical review of the sixth national communication (NC6) of Estonia, coordinated by the secretariat, in accordance with the "Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention" (decision 23/CP.19) and the "Guidelines for review under Article 8 of the Kyoto Protocol" (decision 22/CMP.1).

5. The review took place from 5 to 10 May 2014 in Bonn, Germany, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: Ms. Eglantina Bruci (Albania), Mr. Øyvind Christophersen (Norway), Mr. Sorin Deaconu (Romania), Ms. Agnieszka Maria Janowska (Poland), Mr. Robert Jeszke (Poland), Mr. Bundit Limmeechokchai (Thailand), Ms. Jenny Mager (Chile), Mr. Erick Wamalwa Masafu (Kenya), Mr. Alexander Storch (Austria), Mr. Daniel Tutu Benefoh (Ghana), Mr. Goran Vukmir (Bosnia and Herzegovina) and Mr. Pavel Zámyslický (Czech Republic). Ms. Janowska and Mr. Tutu Benefoh were the lead reviewers. The review was coordinated by Mr. Matthew Dudley and Ms. Barbara Muik (secretariat).

6. During the review, the expert review team (ERT) reviewed each section of the NC6. The ERT also reviewed the supplementary information provided by Estonia as a part of the NC6 in accordance with Article 7, paragraph 2, of the Kyoto Protocol. In addition, the ERT reviewed the information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol, which was provided by Estonia in its 2013 annual submission and previous submissions under Article 7, paragraph 1, of the Kyoto Protocol.

7. In accordance with decisions 23/CP.19 and 22/CMP.1, a draft version of this report was communicated to the Government of Estonia, which provided comments that were considered and incorporated, as appropriate, into this final version of the report.

[1] "Base year" refers to the base year under the Kyoto Protocol, which is 1990 for carbon dioxide, methane and nitrous oxide, and 1995 for perfluorocarbons (PFCs), hydrofluorocarbons (HFCs) and sulphur hexafluoride ($SF_6$). The base year emissions include emissions from sectors/source categories listed in Annex A to the Kyoto Protocol.

## B. Summary

8. The ERT conducted a technical review of the information reported in the NC6 of Estonia in accordance with the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications" (hereinafter referred to as the UNFCCC reporting guidelines). As required by decision 15/CMP.1, supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol[2] is provided in the NC6 (see para 118 below). The supplementary information on the minimization of adverse impacts referred to in paragraph 6 above is complete, but not transparent. The ERT identified gaps and issues in reported information that are summarized in table 1 below.

9. Estonia considered part of the recommendations provided in the report of the in-depth review of the fifth national communication (NC5) of Estonia.[3] The ERT commended Estonia for its improved reporting. During the review, Estonia provided further relevant information, including further information on policies and measures (PaMs) and on projections, including:

(a) Explanatory text and tabular information on recent updates and developments to climate policy;

(b) Information required under the Kyoto Protocol for domestic and regional arrangements and procedures, and PaMs that relate to the target;

(c) Approach and emission factors used and underlying assumptions relating to determination of the total effect of PaMs.

### 1. Completeness and transparency of reporting

10. Gaps and issues related to the reported information identified by the ERT are presented in table 1 below.

### 2. Timeliness

11. The NC6 was submitted on 31 December 2013, before the deadline of 1 January 2014 mandated by decision 9/CP.16. Estonia submitted a revised version of its NC6 on 13 February 2014, which was used as the basis for the review.

### 3. Adherence to the reporting guidelines

12. The information reported by Estonia in its NC6 is mostly in adherence to the UNFCCC reporting guidelines on national communications (NCs) as per decision 4/CP.5 (see table 1).

[2] Decision 15/CMP.1, annex, chapter II.
[3] FCCC/IDR.5/EST.

Table 1
**Assessment of completeness and transparency issues of reported information in the sixth national communication of Estonia**[a]

| *Sections of national communication* | *Completeness* | *Transparency* | *Reference to paragraphs* | *Supplementary information under the Kyoto Protocol* | *Completeness* | *Transparency* | *Reference to paragraphs* |
|---|---|---|---|---|---|---|---|
| Executive summary | Complete | Transparent | | National systems | Complete | Transparent | |
| National circumstances | Complete | Transparent | | National registries | Complete | Transparent | |
| Greenhouse gas inventory | Complete | Transparent | | Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 | Complete | Transparent | |
| Policies and measures (PaMs) | Mostly complete | Partially transparent | 41 | PaMs in accordance with Article 2 | Mostly complete | Mostly transparent | 76 |
| Projections and total effect of PaMs | Mostly complete | Partially transparent | 86, 87, 89, 90, 92, 94, 103 | Domestic and regional programmes and/or arrangements and procedures | Mostly complete | Mostly transparent | 27 |
| Vulnerability assessment, climate change impacts and adaptation measures | Complete | Transparent | | Information under Article 10[b] | NA | NA | |
| Financial resources and transfer of technology | NA | NA | | Financial resources[c] | NA | NA | |
| Research and systematic observation | Complete | Transparent | | Minimization of adverse impacts in accordance with Article 3, paragraph 14 | Complete | Transparent | |
| Education, training and public awareness | Complete | Transparent | | | | | |

*Abbreviation*: NA = not applicable

[a] A list of recommendations pertaining to the completeness and transparency issues identified in this table is included in the chapter on conclusions and recommendations.

[b] For the purposes of reporting information in this table, this assessment refers to information provided by the Party on the provisions contained in Article 4, paragraphs 3, 5 and 7, of the Convention reported under Article 10 of the Kyoto Protocol, which is relevant for developed country Parties and other developed Parties included in Annex II to the Convention only. Assessment of the information provided by the Party on the other provisions of Article 10 of the Kyoto Protocol is provided under the relevant substantive headings under the Convention, for example research and systematic observation.

[c] Reporting on financial resources under the Kyoto Protocol is relevant for developed country Parties and other developed Parties that are included in Annex II to the Convention (Annex II Parties). As Estonia is not an Annex II Party, it does not have an obligation to provide information on financial resources under Article 11 of the Kyoto Protocol, including on "new and additional" resources.

# II. Technical review of the reported information in the national communication and supplementary information under the Kyoto Protocol

## A. Information on greenhouse gas emissions and national circumstances relevant to greenhouse gas emissions and removals, including other elements related to the Kyoto Protocol

### 1. Information on relevant national circumstances

13. In its NC6, Estonia has provided a concise description of the national circumstances and elaborated on the framework legislation and key policy documents on climate change. Further information on the review of the institutional and legislative arrangements for the coordination and implementation of PaMs is provided in chapter II.B below.

14. The NC6 includes all information required by the UNFCCC reporting guidelines on NCs on government structure, population profile, geographic profile, climate profile, economic profile, energy, transportation, industry, waste, building stock and urban infrastructure, agriculture, and forestry. The ERT noted that while during the period 1990–2011, Estonia's gross domestic product (GDP) increased by 49.7 per cent, the population, GHG emissions per GDP and GHG emissions per capita decreased significantly, by 15.7 per cent, 65.5 per cent and 38.7 per cent, respectively. The ERT noted a significant decoupling of total GHG emissions from economic growth. Table 2 illustrates the national circumstances of Estonia by providing some indicators relevant to GHG emissions and removals.

Table 2
**Indicators relevant to greenhouse gas emissions and removals for Estonia**

| | *1990* | *2000* | *2005* | *2010* | *2011* | *Change 1990–2011 (%)* | *Change 2010–2011 (%)* |
|---|---|---|---|---|---|---|---|
| Population (million) | 1.59 | 1.37 | 1.35 | 1.34 | 1.34 | –15.7 | 0.0 |
| GDP (2005 USD billion using PPP) | 16.23 | 15.77 | 22.28 | 22.44 | 24.29 | 49.7 | 8.2 |
| TPES (Mtoe) | 9.91 | 4.71 | 5.16 | 5.57 | 5.60 | –43.5 | 0.5 |
| GHG emissions without LULUCF (Mt $CO_2$ eq) | 40.54 | 17.14 | 18.48 | 19.99 | 20.96 | –48.3 | 4.8 |
| GHG emissions with LULUCF (Mt $CO_2$ eq) | 31.69 | 18.24 | 13.44 | 14.05 | 16.69 | –47.3 | 18.8 |
| GDP per capita (2005 USD thousand using PPP) | 10.21 | 11.51 | 16.50 | 16.75 | 18.13 | 77.6 | 8.2 |
| TPES per capita (toe) | 6.23 | 3.44 | 3.82 | 4.16 | 4.18 | –32.9 | 0.5 |
| GHG emissions per capita (t $CO_2$ eq) | 25.50 | 12.51 | 13.69 | 14.92 | 15.64 | –38.7 | 4.8 |
| GHG emissions per GDP unit (kg $CO_2$ eq per 2005 USD using PPP) | 2.50 | 1.09 | 0.83 | 0.89 | 0.86 | –65.5 | –3.2 |

*Sources:* (1) GHG emissions data: Estonia's 2013 GHG inventory submission, version 1.5; (2) Population, GDP and TPES data: International Energy Agency.

*Note*: The ratios per capita and per GDP unit are calculated relative to GHG emissions without LULUCF; the ratios are calculated using the exact (not rounded) values and may therefore differ from a ratio calculated with the rounded numbers provided in the table.

*Abbreviations*: GDP = gross domestic product, GHG = greenhouse gas, LULUCF = land use, land-use change and forestry, PPP = purchasing power parity, TPES = total primary energy supply.

## 2. Information on the greenhouse gas inventory, emissions and trends

15. Estonia has provided a summary of information on GHG emission trends for the period 1990–2011. This information is fully consistent with the 2013 national GHG inventory. Summary tables, including trend tables for emissions in carbon dioxide equivalent ($CO_2$ eq) (given in the common reporting format tables), are provided in an annex to the NC6. During the review, the ERT took note of the 2014 annual submission. The relevant information therein is reflected in this report.

16. Total GHG emissions[4] excluding emissions and removals from land use, land-use change and forestry (LULUCF) decreased by 48.3 per cent between 1990 and 2011, whereas total GHG emissions including net emissions or removals from LULUCF decreased by 47.3 per cent over the same period. The decrease in total GHG emissions between 1990 and 2011 was mainly attributable to the decrease in carbon dioxide ($CO_2$) emissions by 48.6 per cent, the decrease of methane ($CH_4$) emissions by 42.8 per cent and the decrease of nitrous oxide ($N_2O$) emissions by 55.1 per cent. Emissions of fluorinated gases (F-gases) accounted for about 0.0 per cent of total GHG emissions in 1990 and 0.8 per cent in 2011.

17. In its NC6, Estonia reported that in 2011 the largest sources of emissions (excluding LULUCF) were energy industries (71.0 per cent), transport (10.8 per cent), manufacturing industries and construction (3.8 per cent), agricultural soils (3.4 per cent), other sectors (3.1 per cent) and industrial processes (2.9 per cent).

18. The overall decreasing trend in total GHG emissions between 1990 and 2011 can be attributed to significant emission reductions in the energy sector, of 48.1 per cent, mainly driven by a decrease in emissions from industrial plants owing to closure of energy-intensive plants, and to structural changes in the economy and to improved energy efficiency.

19. Analysis of the drivers for GHG emissions trends in each sector is provided in chapter II.B below. Table 3 provides an overview of GHG emissions by sector from 1990 to 2011.

Table 3
**Greenhouse gas emissions by sector in Estonia, 1990–2011**

| | *GHG emissions (kt $CO_2$ eq)* | | | | *Change (%)* | | *Share[a] by sector (%)* | |
|---|---|---|---|---|---|---|---|---|
| *Sector* | *1990* | *2000* | *2010* | *2011* | *1990–2011* | *2010–2011* | *1990* | *2011* |
| 1. Energy | 35 956.90 | 14 770.96 | 17 767.99 | 18 661.63 | –48.1 | 5.0 | 88.7 | 89.1 |
| A1. Energy industries | 28 775.65 | 11 912.10 | 14 238.63 | 14 875.63 | –48.3 | 4.5 | 71.0 | 71.0 |
| A2. Manufacturing | 2 486.89 | 575.38 | 510.24 | 790.22 | –79.5 | 54.9 | 6.1 | 3.8 |

[4] In this report, the term "total GHG emissions" refers to the aggregated national GHG emissions expressed in terms of $CO_2$ eq excluding land use, land-use change and forestry, unless otherwise specified.

| Sector | GHG emissions (kt $CO_2$ eq) | | | | Change (%) | | Share[a] by sector (%) | |
|---|---|---|---|---|---|---|---|---|
| | 1990 | 2000 | 2010 | 2011 | 1990–2011 | 2010–2011 | 1990 | 2011 |
| industries and construction | | | | | | | | |
| A3. Transport | 2 460.48 | 1 667.13 | 2 248.24 | 2 259.87 | –8.2 | 0.5 | 6.1 | 10.8 |
| A4–A5. Other | 2 052.78 | 519.17 | 687.68 | 660.77 | –67.8 | –3.9 | 5.1 | 3.2 |
| B. Fugitive emissions | 181.10 | 97.17 | 83.19 | 75.14 | –58.5 | –9.7 | 0.4 | 0.4 |
| 2. Industrial processes | 1 048.23 | 705.92 | 493.86 | 613.82 | –41.4 | 24.3 | 2.6 | 2.9 |
| 3. Solvent and other product use | 26.44 | 26.76 | 17.39 | 18.86 | –28.7 | 8.5 | 0.1 | 0.1 |
| 4. Agriculture | 3 166.84 | 1 203.70 | 1 256.59 | 1 270.52 | –59.9 | 1.1 | 7.8 | 6.1 |
| 5. LULUCF | –8 848.70 | 1 099.71 | –5 941.64 | –4 262.81 | –51.8 | –28.3 | –21.8 | –20.3 |
| 6. Waste | 343.72 | 434.83 | 452.94 | 390.76 | 13.7 | –13.7 | 0.8 | 1.9 |
| **GHG total with LULUCF** | **31 693.44** | **18 241.88** | **14 047.13** | **16 692.77** | **–47.3** | **18.8** | **NA** | **NA** |
| **GHG total without LULUCF** | **40 542.14** | **17 142.17** | **19 988.77** | **20 955.58** | **–48.3** | **4.8** | **100.0** | **100.0** |

*Source:* Estonia's 2013 GHG inventory submission, version 1.5 (for GHG emission data).

*Note:* The changes in emissions and the shares by sector are calculated using the exact (not rounded) values and may therefore differ from values calculated with the rounded numbers provided in the table.

*Abbreviations:* GHG = greenhouse gas, LULUCF = land use, land-use change and forestry, NA = not applicable.

[a] The shares of sectors are calculated relative to GHG emissions without LULUCF; for the LULUCF sector, the negative values indicate the share of GHG emissions that was offset by GHG removals through LULUCF.

## 3. National system

20. Estonia provided in its NC6 a description of how its national system is performing the general and specific functions defined in the guidelines for national systems under Article 5, paragraph 1 (decision 19/CMP.1), of the Kyoto Protocol. The description includes all the elements as required in decision 15/CMP.1. The NC6 also referred to the description of a national system provided in the report mandated by decision 13/CMP.1, submitted in 2006,[5] and in the national inventory report of the 2013 annual submission. The ERT took note of the review of the changes to the national system as reflected in the report of the individual review of GHG inventory of Estonia submitted in 2013.

## 4. National registry

21. In its NC6, Estonia has provided information on the national registry in accordance with the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1. The ERT took note of the review of the changes to the national registry as reflected in the report of the individual review of the GHG inventory of Estonia submitted in 2013.

22. Estonia described the changes, specifically the centralization of the European Union Emissions Trading System (EU ETS) operations into a single EU registry operated by the European Commission and called the Consolidated System of European Union Registries

[5] Party's initial report under the Kyoto Protocol. The report to facilitate the calculation of the assigned amount pursuant to Article 3, paragraphs 7 and 8, of the Kyoto Protocol, available at <http://unfccc.int/national_reports/initial_reports_under_the_kyoto_protocol/items/3765.php>.

(CSEUR). The CSEUR is a consolidated platform which implements the national registries in a consolidated manner and was developed together with the new EU registry.

## 5. Domestic and regional programmes and/or legislative arrangements and procedures related to the Kyoto Protocol

23. Estonia has reported in its NC6 information on domestic and regional programmes, and legislative arrangements and procedures related to PaMs implemented and elaborated nationally and in cooperation with other Parties in achieving the quantified economy-wide emission reduction target under Articles 3 and 4 of the Kyoto Protocol.

24. The NC6 does not include some information required by the UNFCCC guidelines on the reporting of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol: relevant legislative arrangements, and enforcement and administrative procedures for all PaMs reported; provisions to make information publicly accessible on these legislative arrangements, and enforcement and administrative procedures; and procedures for addressing cases of non-compliance under domestic law.

25. During the review, Estonia provided additional information to the ERT that elaborated how non-compliance issues are addressed under domestic law. According to the Ambient Air Protection Act, the Ministry of the Environment is responsible for ensuring the commitments under the Kyoto Protocol are met. At the time when the Kyoto Protocol entered into force for Estonia, it was clear that its target would be reached and therefore a decision was made to not focus on non-compliance cases under the first commitment period of the Kyoto Protocol. The ERT found this additional information to be transparent, comprehensive and well organized.

26. During the review, Estonia also provided additional information to the ERT that elaborated the legislative arrangements in support of ensuring that implemented activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol contribute to the conservation of biodiversity and the sustainable use of natural resources. The ERT also found this additional information to be transparent, comprehensive and well organized.

27. The ERT recommends that Estonia enhance its reporting on domestic and regional programmes and/or legislative arrangements and procedures related to the Kyoto Protocol in its next NC to ensure completeness and transparency of the reported information. This includes clearly stated information on relevant legislative arrangements, and enforcement and administrative procedures for all PaMs reported; provisions to make information on these legislative arrangements, and enforcement and administrative procedures publicly accessible; and procedures for addressing cases of non-compliance under domestic law. Further, the ERT recommends Estonia to indicate how reported information relates to the reporting requirements and to improve presentation of this information to ensure transparency of the reported information in its next NC.

28. The overall responsibility for climate change policymaking lies within the Ministry of the Environment of Estonia, and a number of national institutions are involved in the implementation of this policy.

29. The Ministry of the Environment is the highest executive body responsible for the implementation of environmental policy, including climate issues, which are under the responsibility of the Climate and Radiation Department within the Ministry. Responsibilities for some climate issues related to specific sectors, such as renewable energy or climate finances, fall under other ministries such as the Ministry of Economic Affairs and Communications (for energy matters), the Ministry of Agriculture and the Ministry of Finance. However, the Ministry of the Environment is predominantly in charge of coordination between different institutions on climate change matters. In 2009, under the auspices of the Ministry of Economic Affairs and Communications, an energy and climate

agency was given the responsibility to prepare an analysis relating to climate and energy, and also to promote sustainable development. In 2013, the Estonian Environment Agency was established by merging the functions of the Estonian Environment Information Centre and the Estonian Meteorological and Hydrological Institute. Monitoring and evaluation of adopted PaMs is usually performed by the institution that is responsible for implementation of the policy or measure. The PaMs and their effects are evaluated and verified on a biennial basis in line with EU requirements under Regulation No. 525/2013.

30. It is through the National Strategy on Sustainable Development – Sustainable Estonia 21 – that Estonia aims to integrate economic factors with the principles of sustainable development by 2030. This strategy, anchored in the Sustainable Development Act and regulated by the Ambient Air Protection Act, establishes the principles for the sustainable use of natural resources. The strategy is complemented by an objective of the National Programme of Greenhouse Gas Emissions for 2003–2012 to ensure the Estonian target for the first commitment period of the Kyoto Protocol is reached.

31. Several other strategies and programmes address climate policy, such as the Environmental Action Plan (2013–2015) (adopted in 2011), which gives high priority to increasing the use of renewable energy in the energy mix (23.6 per cent by 2015) and stabilizing GHG emissions (at the level of 2010, which was 20 Mt $CO_2$ eq. by 2015).

32. The majority of Estonia's strategies are anchored in or linked to EU policy. As an EU member State, Estonia is required to implement EU climate policy by 2020, the objective of which is a 20 per cent reduction in GHGs by 2020 compared with 1990 levels. In this regard, the EU Emissions Trading Directive (2003/87/EC) and the Effort Sharing Decision (ESD) (406/2009/EC) regulating GHG emission reduction in sectors outside the EU ETS (transport, buildings, agriculture and waste) are key policies.

33. Estonia reported on the provision of public access to information by indicating that since 2002, under Estonian law the Electronic State Journal is considered the authoritative source of legislation.[6] In addition, most action plans are available on the websites of the relevant ministries.

34. Estonia provided a description of national legislative arrangements and administrative procedures that seek to ensure that the implementation of activities under Article 3, paragraph 3, and elected activities under Article 3, paragraph 4, of the Kyoto Protocol also contribute to the conservation of biodiversity and the sustainable use of natural resources. The Forestry Development Plan to 2020 was adopted in 2011 with the overall objective of ensuring sustainable forest management. One of the main criteria in this regard is the long-term stable use of forest resources with a view to maintaining biological diversity, productivity, capacity for regeneration and vitality as well as the potential to fulfil ecological, economic and social functions at the local, national and global levels. All forestry activities, such as clear-cutting and forest renewal, are regulated under the Forest Act and accompanying regulations, enabled by a permit system administered by the Environmental Board. The activities allowed under the Forest Act are in line with the principles of sustainable use of forests. Any change in land use is regulated under the Planning Act and is administered by the Environmental Board and local authorities. There are also strict rules describing when deforestation is allowed.

[6] <http://www.riigiteataja.ee>

## B. Policies and measures, including those in accordance with Article 2 of the Kyoto Protocol

35. Estonia has provided in its NC6 comprehensive and well-organized information on its package of PaMs implemented, adopted and planned in order to fulfil its commitments under the Convention and its Kyoto Protocol.

### 1. Policies and measures related to implementation of commitments under the Convention

36. In its NC6, Estonia reported on its PaMs adopted, implemented and elaborated in achieving its commitments under the Convention. Estonia provided information on PaMs by sector and by gas and a description of the principal PaMs. Estonia has also provided information on how it believes its PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals, consistent with the objective of the Convention. The NC6 contains a similar set of PaMs to those in the NC5, with a few exceptions (e.g. Environmental Action Plan (2013–2015), National Renewable Energy Action Plan to 2020, and Transport Development Plan (2014–2020)).

37. The NC6 does not include information required by the UNFCCC reporting guidelines on the principal PaMs. The ERT found that PaMs provided in the supplementary table differ from those included in the descriptive part of chapter 4 of the NC6. Some of the principal PaMs reported by Estonia in the table do not have a textual description and not all required information is provided for each of the reported PaMs, with missing information relating to the implementing entity and the GHGs affected. The ERT concluded that the way in which the PaMs are reported in the NC6 detracts from a proper understanding of the contribution of each to the achievement of the objectives of the Convention.

38. Estonia included in its NC6 information on PaMs that have been discontinued and the rationale for their discontinuation. An example is the National Programme of Greenhouse Gas Emission Reduction for 2003–2012, which had an objective to ensure that Estonia was capable of achieving its first commitment period target under the Kyoto Protocol. Another example is the Forestry Development Plan to 2010, which was replaced by the corresponding Plan to 2020.

39. The NC6 does not include information required by the UNFCCC reporting guidelines on the effect of PaMs for the years 1995, 2000, 2005 and 2010. During the review, Estonia provided additional information, informing the ERT that the estimates of the effects of PaMs for those years were not available as the relevant analysis had not been developed at the time. Instead, the NC6 includes effects of PaMs resulting from recent analysis and chapter 4 includes this information for some PaMs for the years 2015, 2020, 2025 and 2030.

40. During the review, Estonia provided additional information on the non-mandatory reporting requirements, including an elaboration of costs associated with implementation of some PaMs. An example is the implementation of improvement in the efficiency of use of oil shale, which amounts to about EUR 245 million. Estonia also provided some information on non-greenhouse gas mitigation benefits and explained that these benefits are usually related to reduced emissions of sulphur dioxide ($SO_2$), nitrogen oxides, volatile organic compounds and particulate matter, in the electricity and heat production sectors. For example, new oil shale fluidized bed blocks significantly decreased $SO_2$ emissions in comparison with the previous technology.

41. The ERT recommends that Estonia enhance the completeness of reporting on PaMs by ensuring that all mandatory reporting requirements are included in the submission, including for each of the principal PaMs, the impacts on GHGs affected, the implementing

entity and the status of implementation. The ERT recommend Estonia to explore how to enhance its reporting of the mitigation effects of key PaMs, the costs of implementation of PaMs, and non-greenhouse gas mitigation benefits. Furthermore, the ERT recommend Estonia to enhance the transparency of information presented in chapter 4 of its next NC by including for each sector (by gas) a clear description for each policy or measure, and to structure the information well.

42. Some of the recommendations made in the previous review report were partly taken into consideration in order to improve reporting in the NC6, including information on PaMs subdivided by GHG and estimation of the mitigation impact of individual PaMs.

## 2. Policy framework and cross-sectoral measures

43. The key framework climate and energy policy is anchored in the National Strategy on Sustainable Development – Sustainable Estonia 21 – and also in several other general and sectoral documents. As an EU member State, the majority of Estonia's climate PaMs are derived from the EU climate and energy policy (see paras. 23–34 above).

44. In 2011 Estonia approved the National Reform Programme Estonia 2020, which endorses two major priorities for the Government of Estonia in transitioning to an environmentally sustainable economy and energy sector: (1) implementation of long-term structural changes in the energy sector in line with Estonia's energy security and energy efficiency objectives; and (2) reduction in resource intensity, including the energy intensity of the economy, by improved energy efficiency. The programme includes a goal to keep final energy consumption in 2020 at the level of 2010. The programme also refers to the EU 2020 GHG objectives and targets set for Estonia; namely, that emissions from sectors outside the EU ETS should not increase emissions by more than 11 per cent by 2020 compared with their 2005 levels.

45. Currently, there is no climate strategy in Estonia addressing the period up to 2030 or to 2050. However, a low-carbon development strategy is being planned. In 2013, the Ministry of the Environment commissioned a study to deliver an initial analysis on mitigation potential in all sectors of the economy. Estonia has identified the most successful PaMs to be in the energy sector, and they relate to improving the efficiency of the use of oil shale (mitigation impact of 1,252.34 kt $CO_2$ eq in 2020) and the transformation of the energy supply structure to renewable energy (815.57 kt $CO_2$ eq in 2020) (see paras. 50–57 below).

46. Since 2005, Estonia has participated in the EU ETS, which is a key cross-cutting market-based measure aimed at reducing GHG emissions in the energy and the industrial sectors, and is also a key instrument to achieving the EU climate objectives. Estonia's first national allocation plan, for the EU ETS period 2005–2007, allowed Estonian installations to emit about 56,700 kt $CO_2$ eq. The national allocation plan for the second period (2008–2012) allocated allowances amounting to about 66,510 kt $CO_2$ eq. In the third EU ETS period (2013–2020) there will be no national allocation plans; instead, the allocation of allowances will be through an auction process. However, some free allocations are permissible: for 2013–2020, Estonia is permitted to allocate free allowances amounting to about 18,000 kt $CO_2$ eq. Estonia has decided to use these in its energy sector.

47. Estonia provided comprehensive information on PaMs at the national and subnational/regional levels. Some PaMs are deferred to the local level. Examples of PaMs that are deferred to the local level were provided, including a 2013 measure to introduce free public transport in Tallinn for registered local residents. This has resulted in a significant increase in public transport patronage. Table 4 provides a summary of the reported information on the PaMs of Estonia.

Table 4
**Summary of information on policies and measures reported by Estonia**

| *Sectors affected* | *List of key policies and measures* | *Estimate of mitigation impact (kt $CO_2$ eq)* |
|---|---|---|
| ***Policy framework and cross-sectoral measures*** | European Union Emissions Trading System | NE |
| | Effort Sharing Decision | NE |
| | National Strategy on Sustainable Development – Sustainable Estonia 21 | NE |
| | National Environmental Strategy to 2030 | NE |
| | National Reform Programme (Estonia 2020) | NE |
| | Ambient Air Protection Act | NE |
| ***Energy*** | National Development Plan for the Energy Sector to 2020 | NE |
| Energy supply | The National Development Plan for the Electricity Sector to 2018 | NE |
| | National Development Plan for the Use of Oil Shale (2008–2015) | NE[a] |
| | Improvement of efficiency in the use of oil shale | 1 252.34 |
| Renewable energy | National Renewable Energy Action Plan to 2020 | NE[a] |
| | Transformation of the energy supply structure to renewable energy sources | 815.57 |
| | Support for efficient cogeneration of heat and electricity | 292.45 |
| Energy efficiency | Second National Energy Efficiency Action Plan | NE |
| Residential and commercial sectors | Improvement of energy efficiency and increase in use of renewable energy sources in small boiler houses and improvement of district heating | 156.56 |
| | Promotion of the use of energy-efficient electrical appliances | 153.14 |
| | Investment support and grants for energy-efficient renovation of residential buildings | 28.00 |
| | Investment support for energy-efficient renovation of public buildings | 27.29 |
| ***Transport*** | The Transport Development Plan (2006–2013) | NE[a] |
| | The Transport Development Plan (2014–2020) | NE[a] |
| | Introduction of regulation for the use of biofuels | 235.42 |
| | Promotion of public transport | 21.37 |
| ***Industrial sectors*** | Improvement of energy efficiency in manufacturing industries and construction | 332.12 |
| | Fluorinated gas (F-gas) regulation | NA |

| *Sectors affected* | *List of key policies and measures* | *Estimate of mitigation impact (kt $CO_2$ eq)* |
|---|---|---|
| ***Agriculture*** | Modernization of agriculture holdings and investments in bioenergy production | 127.99 |
| | Support for organic farming | 128.77 |
| ***Forestry*** | Forest Development Program | NE |
| ***Waste management*** | The National Waste Management Plan (2008–2013) | NE[a] |
| | Prohibition concerning percentage of biodegradable waste deposited in landfills | 144.98 |

*Note*: The greenhouse gas reduction estimates given for some measures are reductions in carbon dioxide or carbon dioxide equivalent for 2020.

*Abbreviation*: NE = not estimated.

[a] The total impact on GHG emissions of the specific plan was not provided by Estonia in its NC6. However, many measures that are being implemented are implemented under the specific plan and their specific GHG mitigation impact is reported in the NC6.

## 3. Policies and measures in the energy sector

48. Between 1990 and 2011, GHG emissions from the energy sector decreased by 48.1 per cent (17,295 kt $CO_2$ eq), mainly driven by a decrease in energy consumption resulting from the closure of energy-intensive industrial plants and by structural changes in the economy after 1991. The trend in GHG emissions from fuel combustion showed notable decreases in transport (8.2 per cent or 200.6 kt $CO_2$ eq) and energy use in other sectors (67.8 per cent or 1,392.0 kt $CO_2$ eq).

49. ***Energy supply***. The National Development Plan for the Electricity Sector to 2018 identified a need for fundamental changes in the sector in order to minimize its impact on the environment. To that end, the Plan foresees a significant decrease in electricity production from oil shale, and an increase in other energy sources such as cogeneration and renewable energy. The construction of a nuclear plant is also under consideration. According to the Plan, $CO_2$ emissions from the electricity sector should be at the level of 5 Mt in 2018 compared with 15.7 Mt in 2007, the share of oil shale-based electricity in gross electricity production should not exceed 70 per cent in 2018 compared with 94 per cent in 2007, the share of renewable electricity in gross electricity use should be 15 per cent in 2018 compared with 1.5 per cent in 2007, and the share of cogeneration-sourced electricity (i.e. combined heat and power plants) should reach 20 per cent by 2020 compared with 10 per cent in 2007.

50. The National Development Plan for the Use of Oil Shale (2008–2015) was developed with a view to ensuring application of economic, security and environmental considerations in the use of this fuel. A limit on the annual amount of oil shale mined was set at 20 Mt per year, and this limit is included in the Earth's Crust Act (October 2008). In addition, the use of environmentally sound technologies in oil shale-based power production is increasing in importance in Estonia, resulting in the modernization of power plants, which will lead to a decrease in $CO_2$ intensity of electricity production from about 1.2 t $CO_2$ eq per megawatt-hour (MWh) to about 0.9 t $CO_2$ eq per MWh.

51. ***Renewable energy sources***. Estonia places importance on the role of renewable energy in its economy. In 2010, a new National Renewable Energy Action Plan to 2020 was adopted. Estonia has a renewables 2020 target under EU legislation (Directive 2009/28/EC) in which the share of renewable energy sources (RES) is 25 per cent of total energy consumption by 2020. The Plan specifies measures to achieve this target.

52. A feed-in tariff system is the primary measure to support energy generation from RES. Support for renewable electricity production in 2012 amounted to EUR 53.7 per MWh. In 2012, the total amount paid to RES producers was EUR 62,800,000. The support is funded by electricity consumers and administered by the transmission network operator (AS Elering). RES projects are entitled to investment support from the EU structural funds and Estonia's Green Investment Scheme.

53. ***Energy efficiency***. Estonia considers improving energy efficiency an important element of its energy policy. However, no dedicated domestic energy target has been set in this regard, and obligations to improve energy efficiency are derived from EU strategies and legislation (under the overall EU indicative target to improve energy efficiency by 20 per cent by 2020 compared with 1990).

54. In 2011, the second National Energy Efficiency Action Plan was adopted. This plan carries an energy efficiency target of 9.9 PJ energy savings by 2016 from measures implemented during the period 2008–2016, as set out for Estonia in the EU Energy End-use Efficiency and Energy Services Directive (2006/32/EC). The Plan also sets policy targets for energy performance in the industrial sector, and highlights that energy efficiency measures must focus primarily on improving the skills and awareness of relevant specialists. It also notes that energy conservation measures must focus on encouraging energy audits to be performed, improving auditors' qualifications, improving financing opportunities for energy conservation measures and for small and medium-sized enterprises, as well as developing databases and benchmarking methods. The Plan also set a target for A-label electric appliances sold in Estonia to reach 75 per cent by 2013. The projected savings resulting from the increased efficiency of electrical appliances will increase by 10 per cent by 2020, which is estimated to lead to a potential saving of 0.5 PJ of electricity per year.

55. ***Residential and commercial sectors***. One of the main objectives of the National Development Plan for the Housing Sector (2008–2013) is to improve the quality and sustainability of housing stock in Estonia. The Plan foresees that 8,000 apartment buildings will be refurbished by 2013 that 95 per cent of apartment buildings will have energy performance mapping, and that 10 per cent of apartment buildings will be characterized as being in the highest energy performance category.

56. Several financial instruments are available to achieve these targets, such as a programme implemented by the state-owned foundation KredEx to provide loans for the renovation of apartment buildings. The aim of this measure is to improve energy efficiency of apartment buildings with an area of up to 2,000 $m^2$ by at least 20 per cent and by at least 30 per cent in larger buildings. In 2011, 167 loans were provided, amounting to EUR 16,700,000. The resulting energy savings are estimated to be 39.3 per cent.

57. ***Transport sector***. The Transport Development Plan (2006–2013) included measures aimed at making transport more environmentally friendly; for example, developing a traffic management and coordination system, enhancing competitiveness of public transport and promoting light traffic. Recently, a new Plan for 2014–2020 was adopted. The key objectives of this new plan are to limit the use of energy in the transport sector and to minimize the impact of this sector on the environment. Under this plan, GHG emissions from transport are not to exceed 2,405 kt $CO_2$ eq in 2020; with renewable fuels being an important element of the effort.

58. The second Energy Efficiency Action Plan includes 17 general energy efficiency measures, with some measures relating to the transport sector, the key one being the excise duty on transport fuel. This excise has been increased on several occasions in recent years with a view to place downward pressure on the demand for transport fuel and thereby make it more sustainable. Currently, the excise amounts to EUR 0.42 per litre for unleaded petrol.

59. The National Renewable Energy Action Plan to 2020 includes specific measures for the use of biofuels that are designed to facilitate reaching the 10 per cent RES target as set out in the EU Renewable Energy Sources Directive (2009/28/EC). These include: stipulating a 5–7 per cent mixed biofuel blend for liquid fuels (which is expected to increase the share of biofuels in transport by up to 5 per cent by 2015), transitioning to renewable energy in public transport (which is expected to increase the share of biofuels by 2 per cent by 2020), and increasing the market share of alternative fuelled vehicles to 1 per cent by 2020.

60. In 2011 the Electric Mobility Programme was launched to use revenues arising from assigned amount units (AAUs) surplus sales to enable the introduction of electric vehicles. This programme includes a grant scheme to facilitate acquisition of electric cars by individuals (up to 500 cars) and the construction of associated recharging infrastructure. This programme also includes the condition that electric car owners ensure that sourced electricity comes from a RES certified under the Guarantee of Origin scheme.

61. ***Industrial sector***. Improvement of energy efficiency is one of the key PaMs in the industrial sector (see para. 53–54 above), with a focus on manufacturing industries and construction. There are several planned measures that by 2016 aim to deliver annual savings of 0.6 PJ heat, 0.7 PJ electricity and 0.9 PJ fuels used.

### 4. Policies and measures in other sectors

62. Between 1990 and 2011, GHG emissions from industrial processes (including solvent and other product use), agriculture and waste – as a whole – decreased by 50.0 per cent (2,291.3 kt $CO_2$ eq), mainly driven by the transition to a market economy and by decreasing quantities of synthetic fertilizers being used. However, the waste sector noted an increase in emissions amounting to about 13.7 per cent.

63. ***Industrial processes***. Between 1990 and 2011, GHG emissions from the industrial processes sector decreased by 41.4 per cent (434.4 kt $CO_2$ eq), mainly driven by the transition to a market economy, which resulted in a decrease in industrial production.

64. Total emissions of F-gases have increased significantly since 1994 owing to the increased use of these gases as substitutes for ozone-depleting substances. F-gas emissions are regulated by provisions under EU legislation. Implementation of these provisions was delayed in Estonia; however, in 2012, major amendments to the Ambient Air Protection Act were adopted. The amendments relate to requirements for training, certification and attestation systems; provisions for containment, proper recovery and labelling of F-gases; reporting obligations; and bans and penalties.

65. ***Agriculture***. Between 1990 and 2011, GHG emissions from the agriculture sector decreased by 59.9 per cent (1,896.3 kt $CO_2$ eq), mainly driven by a decrease in livestock and a decrease in the use of synthetic fertilizers.

66. The Rural Development Plan (2007–2013) seeks the use of environmentally friendly agricultural practices. Estonia is currently developing the plan for 2014–2020. The Organic Farming Development Plan (2007–2013) set the following objectives to be achieved by the end of 2013: increases in (1) organically farmed area from 72,800 ha to 120,000 ha; (2) the number of organic producers from 1,173 to 2,000; (3) the number of enterprises processing organic products from 14 to 75; and (4) the market share of organic products produced in Estonia from 0.15 per cent to 3 per cent. The area under organic production has grown rapidly since 2000, and in 2011 covered 14 per cent of total agricultural land. Organic production has increased rapidly, largely driven by financial support provided per organic hectare since 2000.

67. ***LULUCF***. The LULUCF sector was a net source of GHG emissions in Estonia for the years 2000–2003, and a net removal from 2004 to 2011. In 2011, the net removal amounted to 4,262.8 kt $CO_2$ eq, and net removal had decreased by 51.8 per cent since 1990. This trend was mainly driven by wildfires in 2006 and 2008. In the last decade, $CO_2$ emissions have varied widely owing to highly unstable rates of felling and deforestation.

68. Approximately half of Estonian land is covered with forests. The Forest Act provides a legal framework for the management of forests in Estonia. Its main objective is to ensure the protection and sustainable management of forests as an ecosystem, and it establishes the rules for forest regeneration. Currently there are no specific policies targeted directly at GHG reductions in the LULUCF sector; however, several cross-cutting strategies and land-use specific acts refer to issues concerning the sector.

69. The Forestry Development Programme is the official sustainable development strategy for the Estonian forest sector. It sets out the objectives for 2020, as well as the measures and tools by which to achieve them. The main objective is to ensure productivity and viability of forests as well as to ensure multiple and efficient uses of them by, for example, increasing the annual increment along with carbon sequestration in forests by implementing appropriate forest management activities such as regeneration, cleaning and thinning.

70. The Forestry Development Programme is supported by the Rural Development Plan (2007–2013), which funds measures designed specifically for private forest owners, who hold 45 per cent of all forests in Estonia. The Rural Development Plan for 2014–2020 is currently under development. One of its objectives is to promote $CO_2$ uptake in the agriculture and forest sectors, but detailed targets and activities are yet to be defined.

71. ***Waste management***. Between 1990 and 2011, GHG emissions from the waste sector increased by 13.7 per cent (47 kt $CO_2$ eq), mainly driven by increased solid waste disposal on land and increased emissions from the biological treatment of waste.

72. The main objective of the National Waste Management Plan (2008–2013) was to support the closure of non-conforming landfills, and to establish regional landfills and other waste handling facilities, including waste incineration plants and facilities for the biological treatment of waste. A new National Waste Management Plan for 2014–2020 is under development. General waste-related requirements are defined in the Waste Act. In line with EU legislation, the objective for the share of waste recycled is 50 per cent by 2020.

## 5. Policies and measures related to implementation of commitments under the Kyoto Protocol

73. Estonia reported on its package of PaMs adopted, implemented and elaborated in achieving its commitment under the Kyoto Protocol.

74. The NC6 does not include information required by the UNFCCC reporting guidelines on PaMs implemented and/or further elaborated as well as cooperation with other Parties in achieving its quantified emission and reduction commitment under Article 3 in order to promote sustainable development.

75. During the review, Estonia provided additional information, elaborating on the National Strategy on Sustainable Development – Sustainable Estonia 21, which is a key overarching document that ensures Estonia's policies meet sustainability criteria. With regard to cooperation to reach its target, Estonia delivered the agreed GHG reduction largely as a result of a reorganization of the economy and its transition towards a market economy. This allowed Estonia to participate in joint implementation (JI) projects under the Kyoto Protocol, including 12 projects in the period 2002–2012 that realised a combined

reduction of 1.34 Mt $CO_2$ eq. In addition, Estonia is an EU member State and thereby cooperates closely with other EU member States in the field of climate policy.

76. The ERT recommends that Estonia include in its next NC all mandatory reporting requirements concerning PaMs under the Kyoto Protocol. The ERT also recommends that Estonia enhance the transparency of its reporting by structuring its next NC to include relevant information in one clearly marked section.

77. The NC6 includes information on how Estonia promotes and implements the International Civil Aviation Organization/International Maritime Organization decisions to limit emissions from aviation and marine bunker fuels.

78. In its NC6, Estonia reported information on how it strives to implement PaMs under Article 2 of the Kyoto Protocol in such a way as to minimize adverse effects, including the adverse effects of climate change and effects on international trade and social, environmental and economic impacts, on other Parties, especially developing country Parties. Further information on how Estonia strives to implement its commitments under Article 3, paragraph 1, of the Kyoto Protocol in such a way as to minimize adverse social, environmental and economic impacts on developing country Parties, as reported in the 2013 annual submission, is presented in chapter III.B below.

79. The NC6 provided information on adverse effects on climate change, effects on international trade and social, environmental and economic impacts on other Parties. During the review, Estonia mentioned that it expects that the adverse effects of PaMs will not be significant. The ERT encourages Estonia to provide enhanced information on the assessment of such non-significance of adverse effects of its PaMs in its next NC.

## C. Projections and the total effect of policies and measures, including information on supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol

80. In its NC6, Estonia has reported emission projections under 'with measures' and 'with additional measures' scenarios until 2030.

### 1. Projections overview, methodology and key assumptions

81. The GHG emission projections provided by Estonia in the NC6 include a 'with measures' and a 'with additional measures' scenario until 2030, presented relative to actual inventory data for 2010. Projections are presented on a sectoral basis, using the same sectoral categories used in the PaMs section and on a gas-by-gas basis for all the following GHGs: $CO_2$, $CH_4$, $N_2O$, perfluorocarbons (PFCs), hydrofluorocarbons (HFCs) and sulphur hexafluoride (treating PFCs and HFCs collectively in each case). Projections are also provided in an aggregated format for each sector as well as for a national total, using global warming potential (GWP) values from the Intergovernmental Panel on Climate Change Second Assessment Report. Emission projections related to fuel sold to ships and aircraft engaged in international transport were reported separately and not included in the totals.

82. The NC6 does not include some information required by the UNFCCC reporting guidelines: sectoral projection tables that include historical data for 1990, 1995, 2000 and 2005; underlying relevant information on factors and activities for each sector; and an estimate of the total effect of PaMs in accordance with the 'with measures scenario' for historic years.

83. During the review, Estonia provided additional information to enhance the ERT's understanding of the basis and assumptions that underpin the projections. For example, Estonia elaborated on the most relevant sectoral assumptions and driving forces of

development in the energy, industrial, manufacturing, construction and transport sectors; the approach used in each sector; and the 2012 deadline for decisions regarding inclusion of PaMs in the 'with measures' and 'with additional measures' scenarios.

84. Estonia also provided additional background data concerning the development of power plant capacities, fuel consumption in the energy industries, cement production, and transport performance of cars, as well as information on projection method applied in each sector. This information has significantly enhanced the transparency of the projections.

85. The ERT recommends that Estonia improve the transparency of the reported information by providing further background information and detailed data on the general process of development of the 'with measures' scenario, including the definition process of 'policies and measures'.

86. The ERT recommends that Estonia improve the completeness of its reporting on projections by including sectoral projection tables that include historical data for 1990, 1995, 2000 and 2005, and by including the aggregated effect of implemented and adopted PaMs in accordance with the 'with measures' scenario for 2010 in $CO_2$ equivalent.

87. The ERT encourage Estonia to improve transparency of reported information by providing further background information on:

(a) The projection method used and model applied for each sector;

(b) The general process of development of the 'with additional measures' scenario, including solutions to take care of their interaction and cross-cutting effects;

(c) The results of a qualitative impact assessment, including possible wildcards and a ranking of critical factors for emissions and on uncertainties.

88. The 'with measures' and 'with additional measures' scenarios of Estonia cover the period 2011–2030, with the base year of 2010. The 'with measures' scenario considers future GHG emission trends under current PaMs, while 'with additional measures' considers the effect of additional PaMs.

89. Estonia reported on the changes to the methodology compared with the NC5. However, the ERT found that Estonia did not provide sufficient explanatory information to enable a robust assessment of the quantitative impacts of these changes. A brief description of the LEAP[7] model for the energy sector is included in the NC6, but corresponding information concerning the methodology, approach used and the model for the other inputs and sectoral output was found by the ERT to be limited. LEAP is an integrated modelling tool that is used to track energy consumption, production and resource extraction in all economic sectors – it also includes the transport sector. In the non-energy sectors, no specific models were used. The trends in activity data were analysed to compile the projections. LEAP was the only developed model used in the projections. In the waste, agriculture and LULUCF sectors, Excel worksheets were developed for projecting GHG emissions. Although this approach is quite simplistic, Estonia informed the ERT that available data were insufficient for using more complex models to project GHG emissions in these sectors.

90. Estonia provided in its NC6 some assumptions on available energy sources and costs, and on the future development of energy markets and the impact of this development on emissions. However, the ERT concluded that this information could be enhanced by including assumptions relating to technological development.

[7] Long-range Energy Alternatives Planning.

91. During the review, Estonia provided further information in relation to the growth rate of fuel consumption for road transport, transport scenarios, total GHG emissions in the transport sector and GWP factors used (particularly for HFCs).

92. Estonia reported on assumptions for oil shale use, the import and export of electricity, and available energy sources and costs; however, the ERT found that this information was not always transparent. Since its NC5, Estonia has updated assumptions used for the period 2010–2030 in the NC6, including:

(a) Population growth rate – the ERT found this revision not to have a significant impact when compared to the NC5;

(b) Annual gross domestic product (GDP) – the ERT found this revision not to have a significant impact when compared to the NC5;

(c) 'With measures' scenario total consumption of electricity (including losses): slightly lower than the NC5;

(d) Net import of electricity: considerably more exports to 2017 and considerably more imports after 2017 in the NC6;

(e) Production of electricity from wind notably greater in the NC6.

93. The ERT encourages Estonia to enhance the transparency of its reporting on projections by providing more detailed information on the models used, especially:

(a) An explanation for which gases and sectors the model or approach was used;

(b) A description of the type of model or approach used and its characteristics (e.g. top-down model, bottom-up model, accounting model, expert judgement);

(c) A description of the original purpose for which the model or approach was designed and, if applicable, how it has been adapted for GHG emission projections;

(d) A summary of the strengths and weaknesses of the model or approach used;

(e) An explanation of how the model or approach used accounts for any overlap or synergies that may exist between different PaMs.

94. In its NC6, Estonia reports information on the 'with measures' and 'with additional measures' scenarios to 2030. The assumptions underpinning key factors relating to the increase in GHG emissions under the 'with additional measures' scenario (industry growth, transport, fuel switch in households, electricity and heat demand) are mostly cautious. However, the ERT found that it was difficult to test these assumptions in the absence of information (as evidence) in the NC6 (e.g. fuel switch of power plants to less carbon intensive fuels, strong increase in import of electricity).

95. During the review, Estonia provided additional information on the sensitivity analysis, stating that there is no documentation on the impact assessment of important factors affecting GHG emissions in each sector or as a total. GHG emissions from oil shale use for electricity production have accounted for more than half of the total GHG emissions of Estonia in recent years. Estonia explained that as the sensitivity of projections is largely dependent on electricity flows and combustion of oil shale, and with all electricity projected to be generated domestically, this will give rise to increased GHG emissions. No other scenarios have been analysed in the NC6.

### 2. Results of projections

96. Estonia's target under the Kyoto Protocol is an 8 per cent reduction in GHG emissions compared with the base year level, amounting to 39,212.53 kt $CO_2$ eq. According to the GHG inventory data presented in the NC6, average annual emission during 2008–

2011 were around 19,205.90 kt $CO_2$ eq, indicating that Estonia is on track to surpass this target by domestic efforts alone. Estonia does not plan to use the Kyoto Protocol mechanisms to deliver on its commitment. However, Estonia participates in the Kyoto Protocol mechanisms as a host country for JI projects, and also participates in international carbon trading. During the first commitment period, Estonia sold credits amounting to 73,619 kt $CO_2$ eq. Estonia did not elected any LULUCF activities under Article 3, paragraph 4, of the Kyoto Protocol for the first commitment period.[8]

97. For the second commitment period of the Kyoto Protocol (2013–2020), Estonia has committed together with other EU member States and Iceland to achieve the joint target of a GHG emissions reduction of 20 per cent below the base year (1990) level. Estonia reported that according to decision 406/2009/EC, its national target for sectors outside the EU ETS is 11.0 per cent compared with 2005 (a positive limit).

98. Based on the projections provided in the NC6, the projected reductions in GHG emissions from 1990 to 2020 are 35.2 per cent under the 'with measures' scenario and 35.6 per cent under the 'with additional measures' scenario. The projected emission reductions from 1990 to 2030 are 35.6 per cent under the 'with measures' scenario and 40.0 per cent under the 'with additional measures' scenario. The contribution of different gases to Estonia's total emission projections are as follows: for the 'with measures' scenario, total GHG emissions of 17,060.30 kt $CO_2$ eq in 2020 ($CO_2$: 15,088.10 kt; $CH_4$ 930.30 kt $CO_2$ eq; and $N_2O$, 1,054.00 kt $CO_2$ eq). The total GHG emissions are expected to be 16,165.10 kt $CO_2$ eq in 2030 ($CO_2$ 14,213.40 kt; $CH_4$ 930.30 kt $CO_2$ eq; and $N_2O$, 1,023.00 kt $CO_2$ eq). This represents a decrease in $CO_2$ emissions of 15.9 per cent and $CH_4$ emissions of 8.7 per cent, and an increase in $N_2O$ emissions of 6.3 per cent, by 2020 compared with the 2010 levels. The projected emissions of F-gases are negligible. The drivers underlying the projected decrease in emissions relate to the energy sector (see para 95 above).

99. Estonia's longer-term target for the sectors not included in the EU ETS (non-emissions trading system (non-EU ETS) sectors) is an emissions increase of no more than 11 per cent by 2020 relative to 2005 levels. The NC6 contains separate reporting of projected emissions for the EU ETS and non-EU ETS sectors. From 2010 to 2030, non-EU ETS emissions are projected to increase by 15.6 per cent under the 'with measures' scenario and 10.5 per cent under the 'with additional measures' scenario, whereas ETS emissions are projected to decrease 31.4 per cent under the 'with measures' scenario and 32.0 per cent under the 'with additional measures' scenario over the same period. Moreover, Estonia's NC6 indicates that the projected GHG emissions in non-ETS sectors are expected to stay below the Annual Emission Allocations levels.

100. The projections contained in the NC6 are those that are the most recent available.

101. The projected emission levels under different scenarios and information on the Kyoto Protocol targets and quantified economy-wide emission reduction target are presented in table 5 and the figure below.

Table 5
**Summary of greenhouse gas emission projections for Estonia**

| | *Greenhouse gas emissions (kt $CO_2$ eq per year)* | *Changes in relation to the base year[a] level (%)* | *Changes in relation to the 1990 level (%)* |
|---|---|---|---|
| Kyoto Protocol base year[b] | 42 622.31 | NA | 4.9 |

[8] FCCC/IRR/2007/EST.

| | *Greenhouse gas emissions (kt $CO_2$ eq per year)* | *Changes in relation to the base year[a] level (%)* | *Changes in relation to the 1990 level (%)* |
|---|---|---|---|
| Kyoto Protocol target for the first commitment period (2008–2012) | 39 212.53 | -8.0 | -3.3 |
| Kyoto Protocol target for the second commitment period (2013–2020)[c] | Not available yet | NA | NA |
| Quantified economy-wide emission reduction target under the Convention[d] | Not available yet | NA | NA |
| Inventory data 1990[e] | 40 542.14 | -4.9 | NA |
| Inventory data 2011[e] | 20 955.58 | -50.8 | -48.3 |
| Average annual emissions for 2008–2011[e] | 19 205.90 | -54.9 | -52.6 |
| 'Without measures' projections for 2020[f] | NR | NA | NA |
| 'With measures' projections for 2020[f] | 17 060.3 | -60.0 | -57.9 |
| 'With additional measures' projections for 2020[f] | 16 949.7 | -60.2 | -58.2 |
| 'Without measures' projections for 2030 | NR | NA | NA |
| 'With measures' projections for 2030 | 16 165.1 | -62.1 | -60.1 |
| 'With additional measures' projections for 2030 | 15 797.2 | -62.9 | -61.0 |

*Abbreviations:* NA = not applicable, NR = not reported.

[a] "Base year" in this column refers to the base year used for the target under the Kyoto Protocol, while for the target under the Convention it refers to the base year used for that target.

[b] The Kyoto Protocol base year level of emissions is provided in the initial review report contained in document FCCC/IRR/2007/EST.

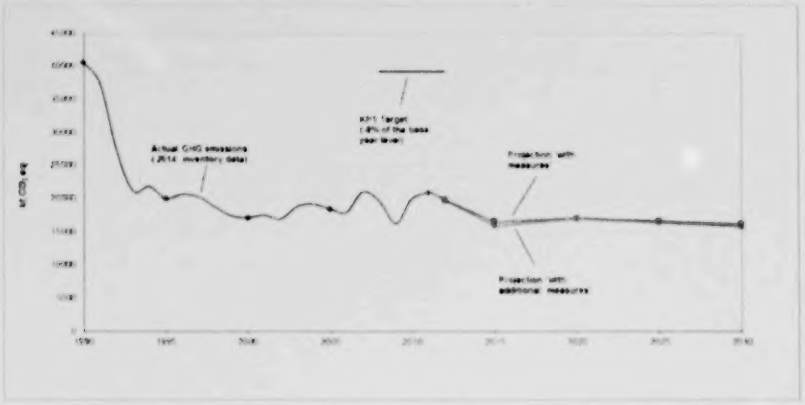
[c] The Kyoto Protocol target for the second commitment period (2013–2020) is a joint target for the European Union and its 28 member States and Iceland. The target is to reduce emissions by 20 per cent by 2020 compared with the base year (1990) level. The target for sectors not covered by the European Union Emissions Trading System is 11 per cent for Estonia under the European Union effort-sharing decision.

[d] Quantified economy-wide emission reduction target under the Convention is a joint target for the European Union and its 28 member States. The target is to reduce emissions by 20 per cent by 2020 compared with the base year (1990) level.

[e] Estonia's 2013 greenhouse gas inventory submission; the emissions are without land use, land-use change and forestry.

[f] Estonia's sixth national communication and/or first biennial report.

**Greenhouse gas emission projections**



*Sources*: (1) Data for the years 1990–2011: Estonia's 2013 greenhouse gas inventory submission, the emissions are without land use, land-use change and forestry. (2) Data for the years 2012–2030: Estonia's sixth national communication and/or first biennial report, the emissions are without land use, land-use change and forestry.

*Note*: The target for the second commitment period of the Kyoto Protocol is based on preliminary estimates of the base year emissions for the first commitment period of the Kyoto Protocol and quantified emission limitation or reduction objective included in annex I to decision 1/CMP.8. The initial assigned amount for the second commitment period will be established after the initial review for the second commitment period of the Kyoto Protocol.

*Abbreviations*: GHG = greenhouse gas, KP1 = first commitment period of the Kyoto Protocol.

## 3. Total effect of policies and measures

102. In the NC6, Estonia reports for 2015, 2020, 2025 and 2030 the estimated total effect of implemented and adopted PaMs for $CO_2$, $CH_4$ and $N_2O$, and also reports an estimate of the total effect of planned PaMs (as total GHG emissions) comparing 'with measures' and 'with additional measures' scenarios. The common tabular format (CTF) tables for 2015, 2020, 2025 and 2030 include information on planned and/or implemented PaMs in terms of GHG emissions avoided or sequestered, by gas (on a $CO_2$ equivalent basis). However, the NC6 does not include this information for the years for 1995, 2000, 2005 and 2010. The ERT recommends that Estonia include in its next NC a quantitative overview of the individual and combined effects of planned, adopted and/or implemented PaMs, in accordance with the 'with measures' definition, compared with a situation without such PaMs, presented in terms of GHG emissions avoided or sequestered, by gas (on a $CO_2$ equivalent basis) for historic years.

103. According to the information reported in the NC6, PaMs implemented in the energy sector will deliver the largest emission reductions, followed by the effect of PaMs implemented in the agriculture, transport and waste sectors. The most effective PaMs and drivers behind GHG emission reductions are described in chapter II.B above. Table 6 provides an overview of the total effect of PaMs as reported by Estonia.

Table 6
**Projected effects of planned, implemented and adopted policies and measures in 2020 and 2030**

| *Sector* | *Effect of implemented and adopted measures (kt $CO_2$ eq)* | *Relative value (% of 1990 emissions)* | *Effect of planned measures (kt $CO_2$ eq)* | *Relative value (% of 1990 emissions)* | *Effect of implemented and adopted measures (kt $CO_2$ eq)* | *Relative value (% of 1990 emissions)* | *Effect of planned measures (kt $CO_2$ eq)* | *Relative value (% of 1990 emissions)* |
|---|---|---|---|---|---|---|---|---|
| | *2020* | | | | *2030* | | | |
| Energy (without transport) | 2 725.34 | 6.6 | 332.12 | 2.5 | 2 723.72 | 6.6 | 296.09 | 2.4 |
| Transport | 21.37 | 0.9 | 235.42 | 9.6 | 18.31 | 10.9 | 267.85 | 10.9 |
| Industrial processes | NR | NA | NR | NA | NR | NA | NR | NA |
| Agriculture | 256.76 | 8.1 | NR | NA | 185.32 | 39.1 | NA | NA |
| Land-use change and forestry | NR | NA | NR | NA | NR | NA | NR | NA |
| Waste management | 144.98 | 42.2 | NR | NA | 134.4 | 39.1 | NR | NA |
| **Total** | **3 148.45** | **6.5** | **567.54** | **2.7** | **3 061.75** | **6.9** | **296.94** | **2.6** |

*Source*: Estonia's sixth national communication.
*Note*: The total effect of planned policies and measures is defined as the difference between the 'with measures' and 'with additional measures' scenarios.
*Abbreviations*: NA = not available, NR = not reported.

### 4. Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol

104. Estonia in its NC6 provided information on how its use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is supplemental to domestic action. The ERT noted that Estonia does not plan to use the market-based mechanisms to meet its Kyoto Protocol target.

105. According to the NC6 Estonia is a host country for JI projects and also sells AAUs under international emissions trading schemes.

106. Regarding Article 17 of the Kyoto Protocol, Estonia decided to sell the surplus of its AAUs through the Green Investment Scheme. This scheme was implemented in August 2009. By February 2013, Estonia had entered into agreements with five European countries (Austria, Denmark, Finland, Netherlands, Sweden), as well as the Baltic Sea region and with 15 Japanese companies. To ensure that the projects under the Green Investment Scheme are implemented in an environmental friendly manner, a special working group led by the Chancellery has been established. The legal framework for the Green Investment Scheme is stipulated in the Ambient Air Protection Act. Each agreement is approved by the Government of Estonia and the Government mandates its Minister of the Environment to sign the agreements.

## D. Vulnerability assessment, climate change impacts and adaptation measures

107. In its NC6, Estonia has provided the required information on the expected impacts of climate change in the country and somewhat limited information on the issues relating to adaptation options at the national and local levels. The ERT noted that Estonia did not provide information on the adaptation options although the Party has provided in the NC6

an overview of progress in the development of the national adaptation strategy since 2013. According to the NC6, Estonia plans to complete the draft adaptation strategy by 2016. The ERT took note of the information provided on the outline of action taken to implement Article 4, paragraph 1(b) and (e), of the Convention, with regard to adaptation. In order to improve completeness of reporting, the ERT recommends that Estonia reports on its national adaptation strategy in its next NC.

108. In its NC6, compared to NC5, Estonia expanded its reporting of information on climate change impacts and vulnerability to include the following: energy, power supply and industry; and construction and infrastructure. Table 7 summarizes the information on vulnerability and adaptation to climate change presented in the NC6.

Table 7
**Summary of information on vulnerability and adaptation to climate change**

| *Vulnerable area* | *Examples comments adaptation measures reported* |
|---|---|
| Agriculture and food security | *Vulnerability*: reduced yields resulting from the increasing prevalence of pests and diseases, accelerating growth and development of graminaceous plants, lengthening vegetation<br>*Adaptation*: NA |
| Energy, power supply and industry | *Vulnerability*: increase in cooling costs for buildings, losses in the distribution and transmission network and disruption in electricity supply due to storms<br>*Adaptation*: NA |
| Tourism | *Vulnerability*: mild snowless winters, especially in southern Estonia contributing to reduction in winter tourism<br>*Adaptation*: promotion of domestic summer tourism owing to lengthening of the warmer period |
| Forests | *Vulnerability*: increase in spruce bark beetle, increased risk of forest fires, more favourable conditions for the spread of root rot, and changes in species composition<br>*Adaptation*: NA |
| Construction and Infrastructure | *Vulnerability*: increase in costs of maintaining infrastructure owing to de-icing, crack formation in roads, accumulation of thickened snow layer on roofs in the event of snow and increase in costs of managing air traffic and maintaining runways<br>*Adaptation*: NA |
| Water resources | *Vulnerability*: increase in infiltration in lowlands owing to rise of the water table leading to reduction in productivity of arable areas<br>*Adaptation*: extensive amelioration of affected soils through reconstruction of drainage systems in agricultural land |

109. In its NC6, Estonia provided information on key climate change impacts relating to low crop yield, disruption in the electricity transmission network due to storms, and increases in forest fires and pests due to high temperatures, but provided limited information on vulnerability and adaptation. In addition, the ERT noted that in the NC6, there is no reference made to tools, methodologies and climate change scenarios used for the vulnerability assessment. Similar observations were made in the previous review report.

110. In its NC6, Estonia has reported information relating to national and local adaptation measures, which mainly highlights coping with storms, flood risk management and disaster risk mitigation. To enhance the transparency of its reporting, the ERT encourages Estonia to provide information on the climate models and various approaches and methodologies used for its vulnerability assessments in its next NC.

## E. Research and systematic observation

111. Estonia has provided information on its actions relating to research and systematic observation, and addressed both domestic and international activities, including the World Climate Programme, the International Geosphere–Biosphere Programme, the Global Climate Observing System (GCOS), the Global Precipitation Climatology Centre, the Climate Information and Prediction Services project, and the work of the Baseline Surface Radiation Network. Furthermore, Estonia has provided a summary of information on GCOS activities.

112. In the NC6 Estonia has indicated that the Estonian Environment Agency weather service is the leading national institution responsible for continuous provision of meteorological and hydrological forecasts, warnings and monitoring. The monitoring involves 107 synoptic and climatology observation programmes as well as others, such as aerological observation, inland water hydrometry and actinometric observation programmes. Estonian institutions have participated in several international research initiatives on terrestrial and ocean observing systems. According to the NC6, the Ministry of Education and Research and the Estonian Research Council have financed climate change related research projects on atmospheric circulation processes, sea and terrestrial climatic observing systems, ionization, satellite image analysis, climate modelling and climate monitoring, while the Ministry of the Environment and the Ministry of Agriculture have financed climate change related research projects that have expanded substantially in recent years. The ERT commends Estonia for its comprehensive reporting on research and systematic observation.

## F. Education, training and public awareness

113. In the NC6, Estonia has provided information on its actions relating to education, training and public awareness at both the domestic and international level. Compared with the NC5, the Party provided more extensive information on public awareness.

114. In addition, the ERT noted that the Ministry of the Environment, Ministry of Education and Research and non-governmental organizations made efforts to mainstream climate change in various public awareness and education programmes relating to the environment. As part of this mainstreaming, the Ministry of the Environment has developed an environmental education programme, which funded close to 2,000 projects through the Environment Investment Centre. The ERT commends Estonia for these efforts and encourages the Party to further facilitate climate change being addressed in existing educational and public awareness policies and programmes and to report on this in its next NC.

115. Estonia reported that public opinion confirms general environmental consciousness of the population and preference towards the benefits of shifting to cleaner sources of energy in the future. This is a result of consistent wide dissemination of information to the general public through the media and the Internet that has occurred over the years. Access to environmental information in Estonia is regulated mainly by the Public Information Act. However, despite this, the attitude of the population of not recognizing the seriousness of climate change has not altered much since 2009.

116. In the NC6 Estonia reported on a number of activities implemented by the Ministry of the Environment, the Ministry of Education and Research and civil society aimed at creating public awareness, disseminating information and supporting educational work on renewable energy, energy efficiency, sustainable transport, eco-driving, a low-carbon economy and climate change. Furthermore, Estonia reported on the inclusion of climate

change in school curricula of basic and upper secondary schools as well as on how climate change is taught at higher levels of education. The ERT encourages Estonia to continue reporting on activities of the Ministry of the Environment, the Ministry of Education and Research and civil society, and on the support provided by the Government of Estonia for public awareness, training and education. Estonia reported on awareness-raising programmes undertaken in recent years; however, it has not provided information on how these programmes are monitored. The ERT encourages Estonia to report on the impact of these programmes and on the relevant monitoring mechanisms in its next NC.

# III. Summary of reviewed supplementary information under the Kyoto Protocol

## A. Overview of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol

117. Supplementary information provided by Estonia under Article 7, paragraph 2, of the Kyoto Protocol in its NC6 is mostly complete and mostly transparent. The supplementary information is located in different sections of the NC6. Table 8 provides an overview of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol as well as references to the NC6 sections in which this information is provided.

118. Estonia has not reported the following elements of the supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol: a description of national legislative arrangements and administrative procedures that seek to ensure that the implementation of activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol also contribute to the conservation of biodiversity and sustainable use of natural resources. The technical assessment of the information reported under Article 7, paragraph 2, of the Kyoto Protocol is contained in the relevant sections of this report. The ERT recommends that Estonia improve completeness of reporting in this regard and include all reporting elements required under Article 7, paragraph 2, of the Kyoto Protocol, in its next NC.

Table 8
**Overview of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol**

| *Supplementary information* | *Reference to the sixth national communication* |
|---|---|
| National registry | Section 3.4 |
| National system | Section 3.3 |
| Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 | Section 5.5 |
| Policies and measures in accordance with Article 2 | Sections 4.2 and 4.3 |
| Domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures | Section 4.1 |
| Information under Article 10 | Sections 3.3, 4.2, 4.3, 6.5, 8 and 9.8 |
| Financial resources | Sections 7 and 9.8 |

*Note:* Reporting on financial resources under the Kyoto Protocol is relevant for developed country Parties and other developed Parties that are included in Annex II to the Convention (Annex II Parties). As Estonia is not an Annex II Party, it does not have an obligation to provide information on financial resources under Article 11 of the Kyoto Protocol, including on "new and additional" resources.

### B. Minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol

119. Estonia reported the information requested in section II, "Minimization of adverse impacts in accordance with Article 3, paragraph 14", of the annex to decision 15/CMP.1 as a part of its 2013 annual submission. Its NC6 noted that the adverse impacts are not significant, therefore requiring no estimates and no initiatives aimed at minimizing adverse impacts. The ERT considers the reported information to be complete and transparent.

120. The 2013 and previous national inventory reports (NIRs) and the additional information provided during the review presented several initiatives of Estonia aimed at minimizing adverse impacts, including assisting developing Parties that are highly dependent on the export of fossil fuels in diversifying their economies and conducting relevant research.

## IV. Conclusions and recommendations

121. The ERT conducted a technical review of the information reported in the NC6 of Estonia according to the UNFCCC reporting guidelines on NCs. The ERT concludes that the NC6 provides a good overview of the national climate policy of Estonia. The information provided in the NC6 includes most elements of the supplementary information under Article 7 of the Kyoto Protocol with the exception of information on: some aspects related to PaMs in accordance with Article 2 of the Kyoto Protocol and domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures. During the review, Estonia provided additional information on domestic and regional arrangements and procedures and PaMs related to the target, and information relating to underlying assumptions and driving forces that underpin projections.

122. Estonia's emissions for 2011 were estimated to be 48.3 per cent below its 1990 level excluding LULUCF and 47.3 per cent below including LULUCF. Emission decreases were driven by transition, commencing in the early 1990s, from a centrally planned to a market-driven economy, massive restructuring of the economy, a reduction in oil shale use and improvements in energy efficiency in power generation.

123. In the NC6, Estonia presents GHG projections for the period from 2010 to 2020 and 2030. Two scenarios are included: 'with measures' scenario; and 'with additional measures' scenario. The projected reductions in GHG emissions, in relation to the base year, under the 'with measures' and 'with additional measures' scenarios, are 35.2 per cent and 35.6 per cent, respectively, in 2020. Based on the comparison with the target (amounting to 39,212.53 kt $CO_2$ eq) and the average annual emissions for 2008–2011 (amounting to 19,205.90 kt CO2 eq), Estonia is in a position to meet its Kyoto Protocol target for the first commitment period (8.0 per cent reduction). For the second commitment period of the Kyoto Protocol (2013–2020), Estonia has committed together with other EU member States and Iceland to achieve the joint target of a GHG emissions reduction of 20 per cent by 2020 below the base year level. According to EU decision 406/2009/EC, Estonia's national target by 2020 for sectors outside the EU ETS is +11 per cent compared with 2005 (a positive limit). Estonia reported projections for the EU ETS and non-EU ETS that indicate that the Party is on course to meet its 2020 target.

124. The NC6 contains information on how Estonia's use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is supplemental to domestic action, although Estonia did not elaborate on supplementarity as such. Estonia is not planning to make use of the Kyoto Protocol mechanisms to meet its Kyoto Protocol target.

125. Estonia reported on its PaMs adopted, implemented and planned in achieving its commitments under the Convention and its Kyoto Protocol. The implemented and adopted PaMs with the highest mitigation effect are in the energy sector and include retrofitting of power stations to ensure efficient use of oil shale, improved energy efficiency, cogeneration projects and the promotion of clean transport. The overarching document is the strategy Sustainable Estonia 21, which aims to ensure the sustainable development of Estonia. The National Programme of Greenhouse Gas Emissions for 2003–2012 was in place to ensure that Estonia delivered on its Kyoto Protocol target for the first commitment period. Estonia's key medium-term and long-term programmes and plans are derived directly from EU climate policy – the EU 2020 climate and energy package sets clear climate objectives by 2020. Under this legislation, Estonia is permitted to increase its GHG emissions from sectors outside the EU ETS by 11 per cent by 2020 compared with the 2005 level. This contribution is in line with the overall EU target to reduce GHG emissions by 20 per cent by 2020 compared with the 1990 level. Estonia is currently working on its low-carbon development strategy.

126. The description of climate change impacts, vulnerability and adaptation in the NC6 focused mainly on the impacts of climate change, the sectors vulnerable to climate change and the general action being taken to adapt to climate change. Estonia indicated that the key sectors vulnerable to climate change are electricity supply, crop production, infrastructure and forests. The NC6 does not provide in detail the sector-specific adaptation measures being implemented or planned. Estonia did not provide in the NC6 its actions regarding cooperation with other countries on adaptation.

127. Estonia provided comprehensive information on its education, training and public awareness activities in the NC6. Education on climate change in Estonia has been formalized through funding of projects under the Environment Investment Centre.

128. The NC6 provides information on Estonia's Research and Systematic Observation activities and programmes at both the domestic and the international level. Estonia is strengthening its scientific institutions and increasing funding for research.

129. Supplementary information under Article 7, paragraph 1, of the Kyoto Protocol on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol is provided by Estonia in its 2013 annual submission.

130. In the course of the review, the ERT formulated several recommendations relating to the completeness and transparency of Estonia's reporting under the Convention and its Kyoto Protocol. The key recommendations[9] are that Estonia:

(a) Improve completeness of reporting by including in the next NC the following:

(i) An estimate of the total effect of PaMs for 2010;

(ii) Projections presented in relation to the inventory data;

(iii) Information required under the Kyoto Protocol, especially in relation to PaMs in accordance with Article 2, and on domestic and regional programmes and/or arrangements and procedures;

(b) Improve the transparency of reporting by including in the next NC the following:

(i) Information covering all mandatory aspects for each of the principal PaMs reported for each sector, subdivided by gas, with a clear and consistent structure for

[9] The recommendations are given in full in the relevant sections of this report.

reported information, including a textual description accompanied by the table, as stipulated in the UNFCCC reporting guidelines;

(ii) How the aggregated effect of implemented and adopted policies and measures is calculated;

(iii) Underlying relevant information on factors and activities for each sector, to provide the reader with an understanding of emission trends in the years 1990–2020.

## V. Questions of implementation

131. During the review, the ERT assessed the NC6, including supplementary information provided under Article 7, paragraph 2, of the Kyoto Protocol and reviewed information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol, with regard to timeliness, completeness, transparency and adherence to the reporting guidelines on NCs. No question of implementation was raised by the ERT during the review.

# Annex

## Documents and information used during the review

### A. Reference documents

"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications". FCCC/CP/1999/7. Available at <http://unfccc.int/resource/docs/cop5/07.pdf>.

"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories". FCCC/CP/1999/7. Available at <http://unfccc.int/resource/docs/cop5/07.pdf>.

"Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol". Decision 15/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a02.pdf#page=54>.

"Guidelines for review under Article 8 of the Kyoto Protocol". Decision 22/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf#page=51>.

"Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention". Annex to decision 23/CP.19. Available at <http://unfccc.int/resource/docs/2013/cop19/eng/10a02.pdf#page=20>.

FCCC/SBI/2011/INF.1. Compilation and synthesis of fifth national communications. Executive summary. Note by the secretariat. Available at <http://unfccc.int/resource/docs/2011/sbi/eng/inf01.pdf>.

FCCC/SBI/2011/INF.1/Add.1. Compilation and synthesis of fifth national communications. Note by the secretariat. Addendum. Policies, measures, and past and projected future greenhouse gas emission trends of Parties included in Annex I to the Convention. Available at <http://unfccc.int/resource/docs/2011/sbi/eng/inf01a01.pdf>.

FCCC/SBI/2011/INF.1/Add.2. Compilation and synthesis of fifth national communications. Note by the secretariat. Addendum. Financial resources, technology transfer, vulnerability, adaptation and other issues relating to the implementation of the Convention by Parties included in Annex I to the Convention. Available at <http://unfccc.int/resource/docs/2011/sbi/eng/inf01a02.pdf>.

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FCCC/IRR/2007/EST. Report of the review of the initial report of Estonia. Available at <http://unfccc.int/resource/docs/2007/irr/est.pdf>.

FCCC/IDR.5/EST. Report of the in-depth review of the fifth national communication of Estonia. Available at <http://unfccc.int/resource/docs/2011/idr/est05.pdf>.

Sixth national communication of Estonia. Available at <http://unfccc.int/files/national_reports/non-annex_i_natcom/application/pdf/est_nc6.pdf>.

2013 GHG inventory submission of Estonia. Available at <http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/7383.php>.

2014 GHG inventory submission of Estonia. Available at <http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/8108.php>.

## B. Additional information provided by the Party

Responses to questions during the review were received from Ms. Ingrid Võrno (Ministry of the Environment, Tallinn), including additional material on updated policies and measures, greenhouse gas projections, the national registry and recent climate policy developments in Estonia.